

APPENDIX A

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Width is difference between maximum and minimum received during last 3 sec period TTP.
Offset is minimum received TTP.
FrameSizeMS is constant and equals to frame size in milliseconds (for example in G.VM coded it equals to 30)

/* MaxTTP is value of maximum TTP in the statistics */
MaxTTPn = Offsetn - Widthn

/* DeltaWidthn may be used in estimating LocalExtremumSizen, when burst in width */
If (Widthn > Widthn-1)
    DeltaWidthn = Widthn
Else
    DeltaWidthn = 0

/* WidthBoundn is a temporary bound value used for burst detection */
If (Widthn > 0)
    WidthBoundn = -60
Else
    WidthBoundn = 3 * Widthn-1

/* Burstn is set to 1, when there is a burst detected in current statistics. It is set to 0 otherwise */
If (
    or Widthn - Widthn-1 > 200ms
    or Widthn > WidthBoundn
    or ((Offsetn - Offsetn-1) > 200ms) and (MaxTTPn MaxTTPn-1 > 200ms)
    or (Offsetn - Offsetn-1) > 3 * min(Widthn, Widthn-1)
)
    Burstn = 1
Else
    Burstn = 0

/* BurstLikelihood reflects likelihood of burst. When it is close to 0, we have low burst likelihood. When
it is close to 1, we have high burst likelihood */
If (Burstn = 1)
    BurstLikelihoodn = BurstLikelihoodn-1 * 0.75 + 0.25
Else
    BurstLikelihoodn = BurstLikelihoodn-1 * 19/20

/* Burst2AbsoluteCoef is jitter buffer adaptation factor. When it is close to 1, jitter buffer size is
close to average burst size and reduced slow. When it is close to 0, it is reduced fast. It set to:
0.5 in not busy environment
0.9 when there is a medium burst likelihood
1.0 when there is a very high burst likelihood */
If (BurstLikelihood < 0.3)
    Burst2AbsoluteCoefn = 0.5
Else If (BurstLikelihood < 0.4)
    Burst2AbsoluteCoefn = 0.9
Else
    Burst2AbsoluteCoefn = 1

/* DeltaOffset is a temporary value used in estimation of desired jitter buffer change
(LocalExtremumSize) */
If (Offsetn > 0 and Offsetn > Offsetn-1 and Burstn = 0)
    DeltaOffsetn = max(Widthn, Offsetn - Offsetn-1)
Else
    DeltaOffsetn = 0

/* LocalExtremumSizen is maximum growth between Width and Offset growths. */
LocalExtremumSizen = max(DeltaWidthn, DeltaOffsetn)

/* DesiredJitterBufferSize reflects what is expected burst length */
if (DesiredJitterBufferSizen-1 < LocalExtremumSizen)
    DesiredJitterBufferSizen = DesiredJitterBufferSizen-1 * (1 - Burst2AbsoluteCoefn) + LocalExtremumSizen
Else
    DesiredJitterBufferSizen = DesiredJitterBufferSizen-1 * Burst2AbsoluteCoefn + Widthn * (1 - Burst2AbsoluteCoefn)

/* ReduceFactorn tells how fast jitter buffer size should be adjusted to DesiredJitterBufferSize. */
ReduceFactorn = max(0, min(BurstLikelihoodn, 0.5) * 2 - 0.1)

/* TimeToReducen tells how much jitter buffer desired to be changed (taking burst into account) */
If (Offsetn > 0)
    TimeToReducen = Offsetn * (1 - ReduceFactorn)
Else
    TimeToReducen = Offsetn

/* OffsetOut is TimeToReducen, rounded to multiple of FrameSizeMS. This value tells how much jitter buffer
should be adjusted (relatively to current jitter buffer size). */
OffsetOutn = FrameSizeMS * round(TimeToReducen / FrameSizeMS)

/* OffsetOut is DesiredJitterBufferSize, rounded to multiple of FrameSizeMS. It tells absolute size that
jitter buffer should be. This value is used when jitter buffer is built from scratch */
AbsoluteOutn = FrameSizeMS * round(DesiredJitterBufferSizen / FrameSizeMS)

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